FAIRBANKS-MORSE

Home Water Service

"Wherever there is Life there's need for Running Water"

Foreword

WATER under pressure is no longer the costly luxury it once was. It makes no difference where you live, so long as there is a supply of water within reasonable distance you can enjoy the same conveniences as those living along city water mains

In this book you will find the subject of water under pressure fully covered from every angle. No time, trouble or expense has been spared in the preparation of this material. Many years of experience have been drawn upon and there has been added to that the most exhaustive investigation of its kind ever made.

For your convenience we have divided the contents of this book into three sections with several chapters in each section. Believing that most people who write to us for water service information are more desirous of knowing *how* to solve their individual problems than they are of reading about the many advantages of running water under pressure, we have devoted the first half of this book to diagrams and descriptions of typical installations of both shallow and deep well systems.

For those who are not yet fully cognizant of the many advantages of water under pressure in the home, the second section will be of great interest. The third section is devoted to a few illustrations and brief descriptions of F-M Home Water Systems.

Some chapters will apply more directly to your individual case than others and of course you will want to spend more time on them. But the information generally is so interesting and instructive that you will find it well worth while reading the entire book.

If there are any questions you would like to ask, do not hesitate to write the nearest F-M branch house.

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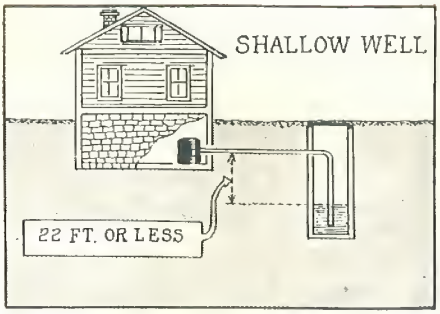
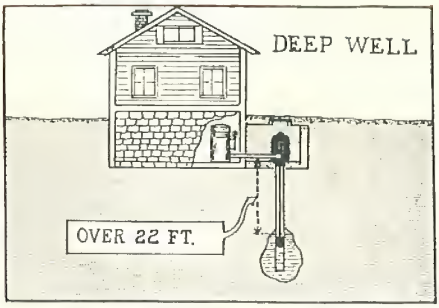
Price 50 Cents





About Shallow Well Pumps

WELL pumps, regardless of make, are divided into two classes—the suction or *shallow* well type and the *deep* well type.

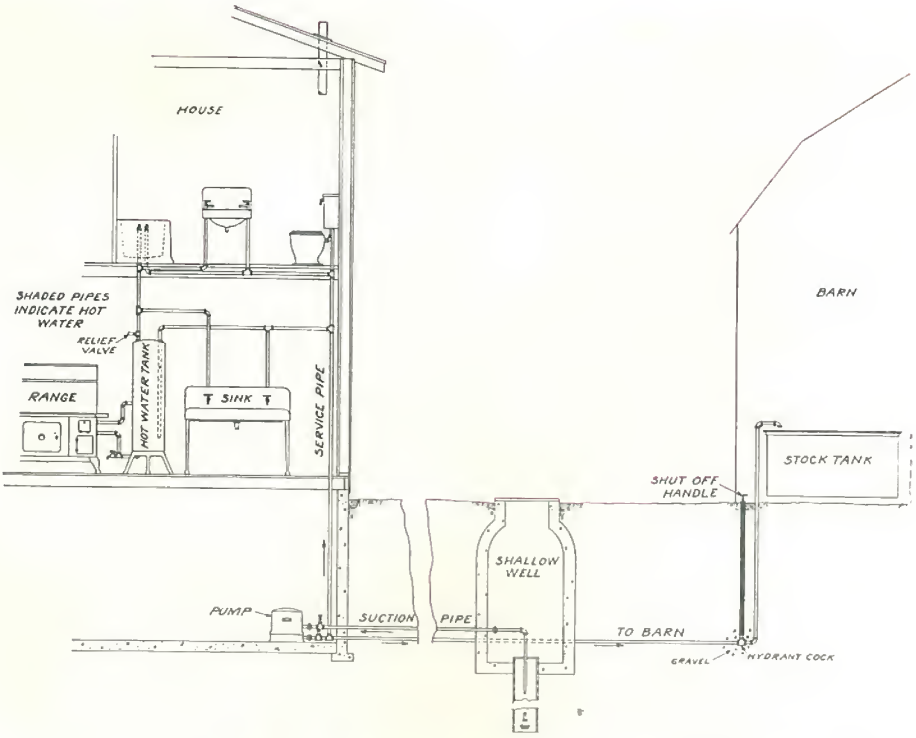
In order to know which type of pump to recommend, it is necessary to know the vertical distance from the inlet opening of the pump to the lowest level in the source of supply while the pump is being operated; also the total distance from the water level to the pump.

Shallow well pumps operate on the "suction" principle. They may be used only where the vertical lift is 22 feet or less. Deep well pumps are designed for use where the water lift is greater than 22 feet.

In a shallow well pump, by the movement of the pump piston, a vacuum is created in the pipe leading to the well or cistern, which is called the suction pipe, and the pressure of the atmosphere, bearing on the surface of the water in the well, forces the water through the suction pipe to the pump, where the piston of the pump discharges it—under pressure—to the faucets or into the storage tank.

Naturally, the greater the atmospheric pressure, the higher the water will rise. The sea level atmospheric pressure is 14.7 lbs. This is equivalent to approximately 33′ elevation. However, it is impossible to create a perfect vacuum and for practical purposes it is not safe to figure on raising water at sea level more than 22′ by "suction". At higher altitudes, where the atmospheric pressure is less, the water will not rise quite that high. For every 1,000 feet above the sea, there will be a reduction of about one foot in the vertical lifting power of the pump. At 1,000 feet above the sea, in other words, the vertical distance from the pump to the water should not exceed 21 feet; at 2,000 feet, the vertical distance should not exceed 20 feet, etc.

A Fairbanks Morse Home Water System in the home means freedom from the old back-breaking method of pumping, lifting and lugging every drop of water that is needed. It means sanitation, a modern plumbing system, an up to-date toilet, a bathtub, a spotless enameled kitchen sink, a convenient laundry in the basement. It means hot and cold water under pressure. It means soft water at the faucets where a cistern is used. It adds to the health and happiness of the home. It is the cheapest servant that can be hired. *In short, wherever there is life, there is need for running water.*



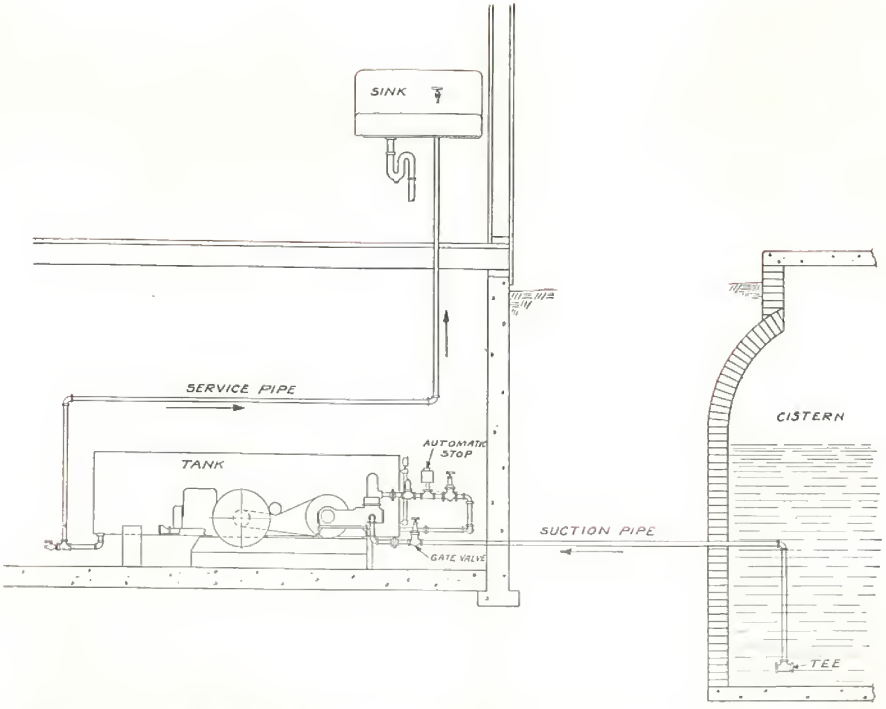
Shallow Well Water System Installation #1

THE installation shown here is a typical one and is also ideal. The electric pumping unit is placed in the basement and the straight suction pipe runs to the shallow well. The discharge pipe is arranged to service both the house and the barn where the stock tank is located or to individual drinking cups for the dairy herd. The installation here is for cold climates as the discharge line to the barn is below the frost line; in a mild climate it is not necessary to place the suction line as deep underground as is shown.

This type installation is for a suction pump and the water level of the well must not be over 22′ below the pump. Note the arrangement of the plumbing for having available both hot and cold water under pressure.

Also note hydrant in yard with hydrant cock placed in loose gravel or box for draining vertical pipe to stock tank. Either a 210 or 420 G.P.H. F-M Automatic Electric Shallow Well Pump is recommended here. In case electricity is not available, an F-M "Z" Engine pumping unit may be used as shown in No. 2.

Occasionally, the water level in the well is just beyond the reach of a shallow well pump if it were located directly over the well. But by locating the pump in the basement a shallow well pump can be used if the vertical distance to the water level does not exceed 22 feet.



Shallow Well Water System Installation #2

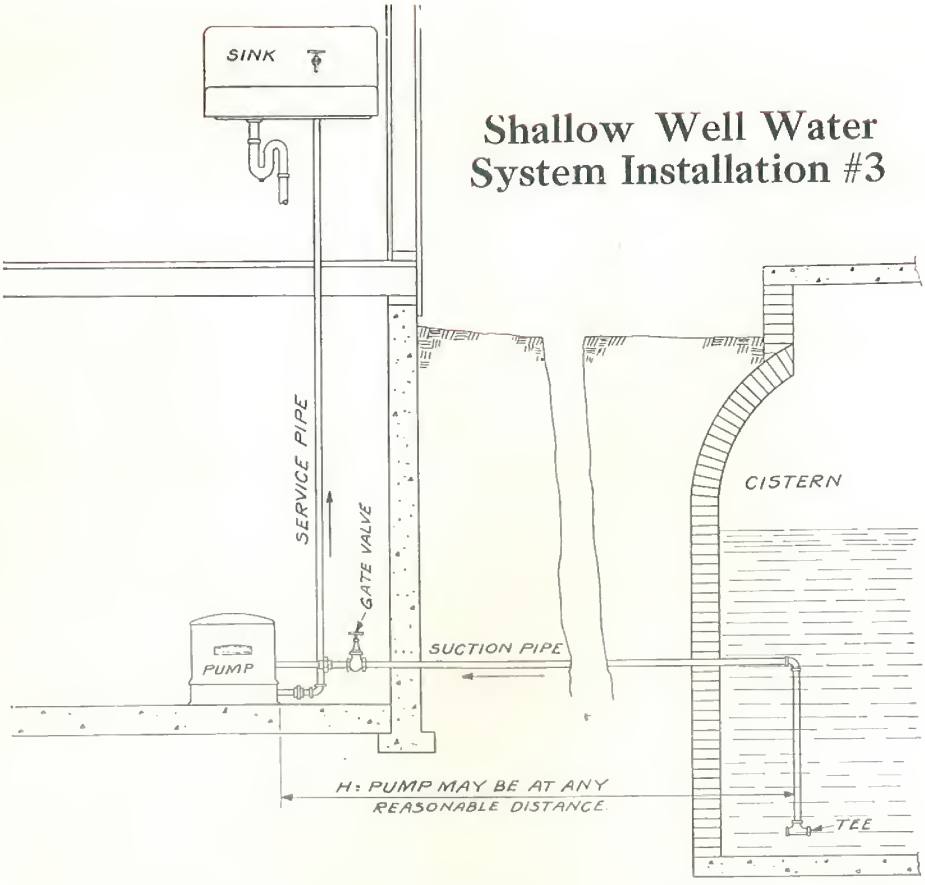
IN THE installation shown here, electricity is not available, and accordingly an F-M "Z" Engine and Typhoon Pump unit is used. The outfit in No. 1 is both automatic start and stop. This unit stops automatically when the pressure in the tank reaches 40-50 lbs., but it is necessary to start it manually.

This same outfit can be used with a shallow well as the source of supply as in No. 1. Also the piping arrangement in the house for both hot and cold water would be the same with this engine driven pump.

A gate valve is shown in the suction line as very often the water level in a cistern would rise about it. Closing this valve prevents flooding the basement should it ever become necessary to disconnect the pump.

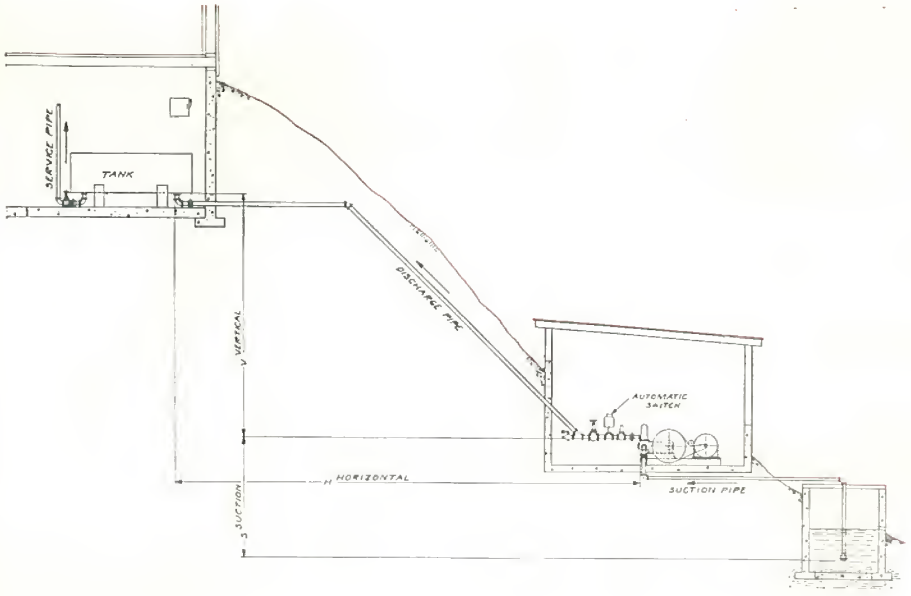
The outfit recommended for this service is either an F M "Z" Engine with F-M Self-Oiling Typhoon pump or a "Z" Engine with Type "JK" Pump shown on pages 28 and 29.

Shallow Well Water System Installation #3



THIS shows a typical cistern installation where electricity is available and where it is desired to pump only cold water to the kitchen sink. The pump is located in the basement with the suction line under ground. As the water level is higher than the pump a shut off or gate valve is placed in the suction line. By partially closing this valve it is possible to create the equivalent of at least 6′ vertical suction lift, otherwise, the snifter valve would not operate. Closing this valve also prevents flooding the basement should it ever become necessary to disconnect the pump. A riser or air chamber can be placed between the gate valve and pump if it is found that the water comes to the pump under sufficient head to cause a slight knock.

For providing both hot and cold soft water under pressure the general arrangement for heating the water as shown in No. 1 can be used. If there is no basement, the pump can be set under the sink as it is very compact. A tee is recommended on the end of the suction pipe to prevent sediment from being sucked up from bottom of the cistern.



Shallow Well Water System Installation #4

OFTEN times the source of water supply, either shallow well, spring, lake or stream, is located at the foot of a hill and it is desired to pump the water up to the house and other buildings located on the hill top.

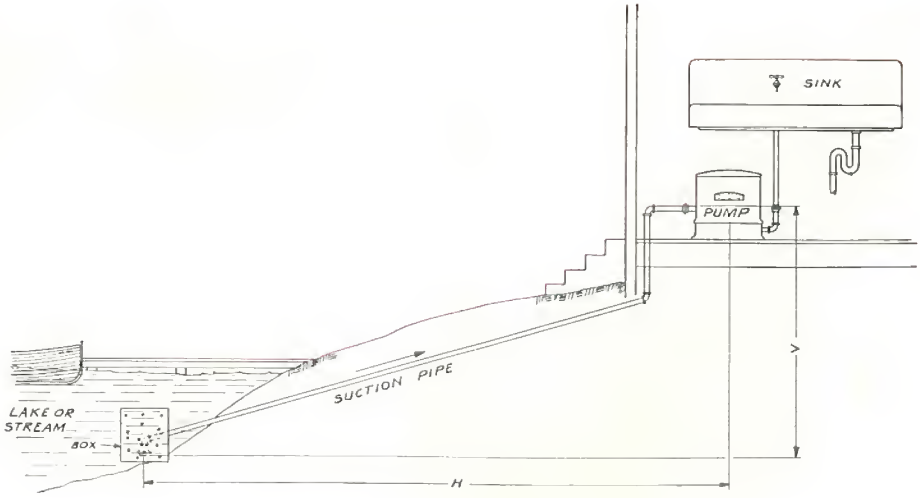
In the installation shown here, electricity is available. Accordingly an F-M Motor Driven Self-Oiling Typhoon Pump outfit is used. By locating the tank in the basement, it is not subject to as high pressure as would be necessary if located at the lower level. This means a greater factor of safety, or in some instances a less expensive tank.

The size of the motor used is dependent upon the height of elevation as the unit is designed for 100 lbs. maximum working pressure at the pump. This outfit is equipped with an automatic self starting and stop switch. To provide the required pressure at the house this automatic switch must be set accordingly.

Suction pipe in well is equipped with foot valve and strainer which keeps pumps primed and prevents pumping in floating foreign matter, moss, etc.

In cold climates a frost-proof pit for housing the pump should be provided.

If electricity is not available an F-M "Z" Engine-Driven Self-Oiling Typhoon Pump Outfit is recommended as shown on page 29.



Shallow Well Water System Installation #5

THE installation shown here is an ideal one for use at a summer cottage as it is an extremely inexpensive one and easily installed.

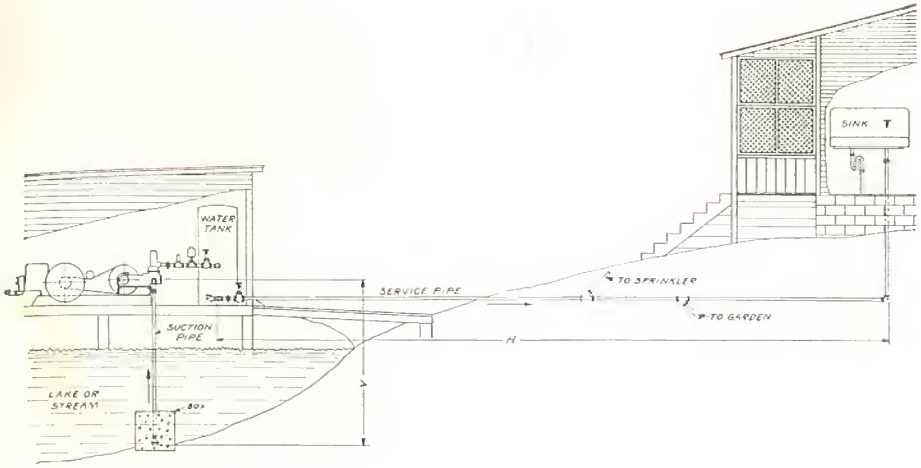
Most summer cottages at lake resorts do not have basements as heating systems are usually not required and any warmth that is desired can be provided by the more pleasing open fire-place. For this reason the F-M Automatic Electric Shallow Well Pump is exceptionally desirable as its small, compact size permits its being placed under the kitchen sink.

The illustration shows the source of water supply a lake or stream. The suction pipe can be laid on the surface of the ground or just underground as the outfit would probably be used only during the summer months. Accordingly frost-proofing is unnecessary.

The suction pipe should have a gradual slope downward to the source of supply. The vertical distance "V" can not be over 22′ including pipe friction. If the horizontal distance "H" is over 50′ a larger diameter pipe size should be used.

The end of the suction pipe should be equipped with a foot valve and this should be placed in a wood box with perforations or crate covered with ½″ mesh wire. The box should be placed about 2′ under the surface of the water. This arrangement does not disturb the sediment and vegetation, and floating moss cannot get into the suction pipe.

If the source of supply is located some distance away over rolling ground, as is sometimes the case when it is a shallow well or spring, it is always best to locate the pump at the source as water can not be drawn successfully over hills.



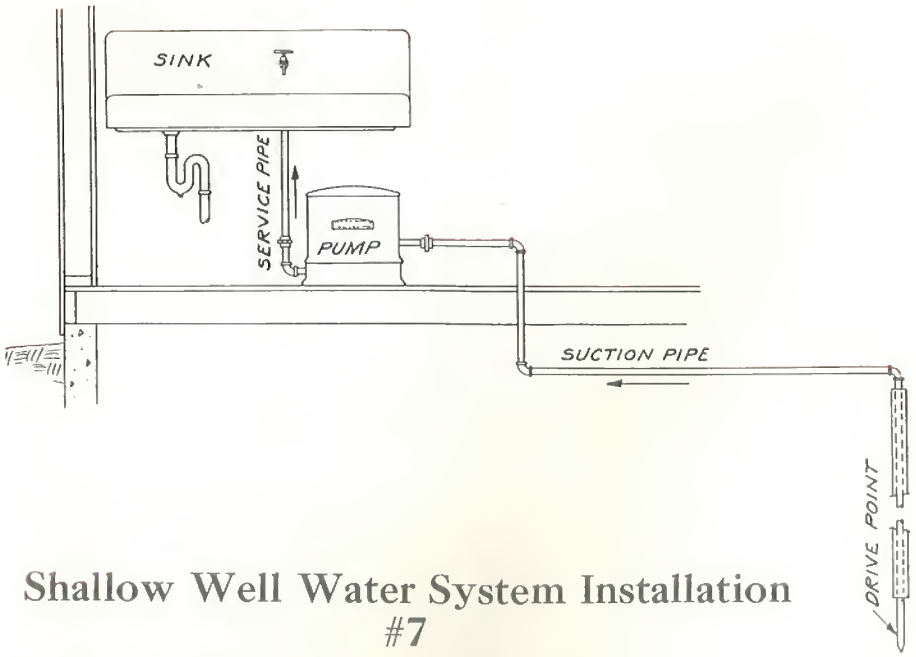
Shallow Well Water System Installation #6

THIS installation is an especially good one for a summer home where there is a large amount of water required for use by a large family, small hotel, or for sprinkling the lawns, gardens, etc.

As shown it is laid out for "Z" Engine drive but the same pumping unit can be operated by a motor if electricity is available.

Here we have placed the water tank and the pumping outfit in the boat house but if desired the tank can be placed in the basement or kitchen of the house. Should it be desired to furnish both hot and cold water to the kitchen sink and bathroom the general piping arrangement as shown in No. 1 can be used here.

As in No. 5 the suction pipe is equipped with a foot valve and strainer and placed within a perforated wood box or screen covered crate installed a few feet below the surface of the water to prevent entrance of vegetation or moss. This method of protecting the open end of the suction pipe is also very desirable where the source of supply is a fast moving stream, as current eddies might cause an air pocket and break the suction.



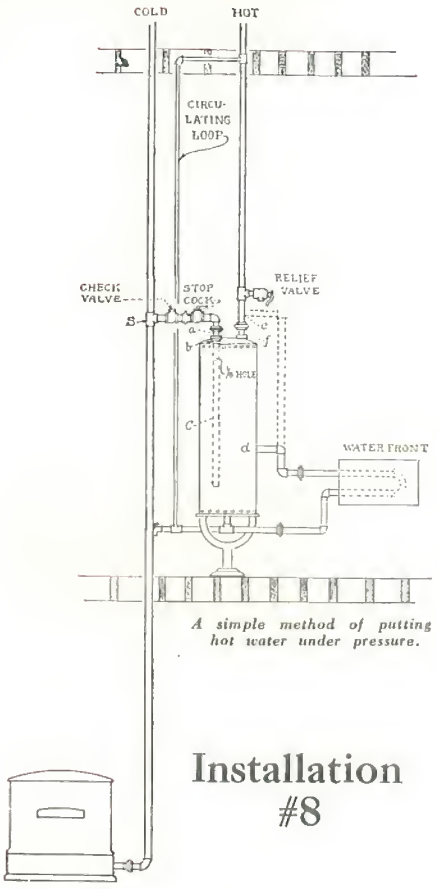
Shallow Well Water System Installation #7

IN CERTAIN locations it is sometimes possible to drive a pipe, provided at the lower end with a pointed strainer, down into the water-bearing stratum, screw a suction pump to it at the upper end and the installation is ready to work.

On driven wells as these are called either an F-M electric or engine-driven water system can be used. Oftentimes the sand point can be driven in the basement and the pump located therein, making an inexpensive and comparatively easy installation. In case the well has a tendency to pump sand a length of ¾ inch pipe without couplings to which a ¾ inch Clear-flow foot valve is attached, should be inserted within the 1¼" casing. If the well is too small to permit of a separate casing, the connection can be made to the top of the casing, in which case the well should be thoroughly pumped out before attaching the pump.

To drive a well, take post hole digger and go down as far as possible. Then screw a 1¼" drive-point on a piece of 1¼" pipe. Fill in screen openings with cheap soap, then drive point into water bearing gravel. Test as you go down by filling the pipe with water. If you cannot fill it, it means that you are not in good water bearing gravel. Try a pitcher spout pump. If the handle kicks back and the water does not clear up, drive the point about 6 inches to 1 foot deeper. The soap on the point keeps all dirt from closing the screen and after it is in the water a while, it will clear out.

Hot Water Under Pressure



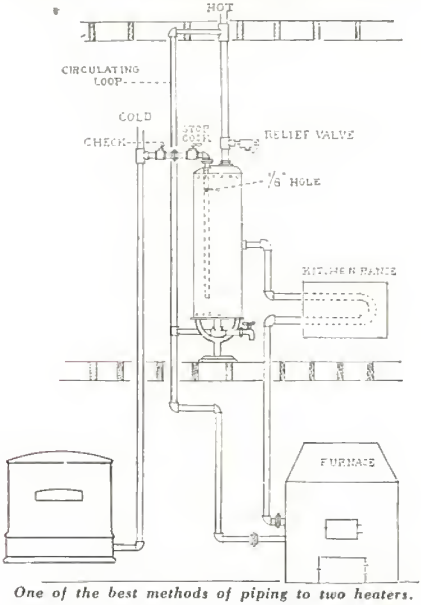
A simple method of putting hot water under pressure.

Installation #8

WITH any F-M Home Water System, it is just as easy to put the hot water under pressure as it is the cold water. The two diagrams here show how this can be done. In the case of a pressure tank system it is only necessary to connect on to the service supply pipe which leads from the water plant tank to the fixtures. This connection is shown at "S". The check valve in the cold water pipe is for the purpose of preventing the hot water from backing up into the water plant tank. The relief valve is a very necessary protection against excess pressure.

Very often it is desired to connect the range boiler so that it may be heated from the furnace in the basement or kitchen range upstairs. The diagram below shows how simple this arrangement is made. Note that the circulation of the hot water is continuous from the furnace to ran front, to the boiler, to the fixtures, returning to the furnace when cooled.

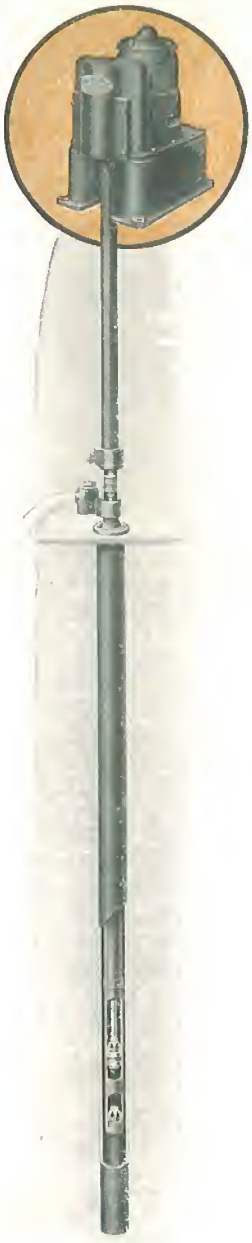
This system will operate whenever there is a fire in the furnace or in the kitchen range—or both



One of the best methods of piping to two heaters.

Installation #9

About Deep Well Pumps



IF THE vertical distance from the bottom of the pump to the water level is more than 22 feet, *a deep well pumping unit must be used.*

This unit consists of a power head, a well cylinder, which is suspended in the well by means of a drop pipe, and a pump rod which connects the plunger of the power head to the plunger of the well cylinder.

When the system is in operation, the water in the cylinder is forced up to the surface through the drop pipe and then into the storage tank. From the storage tank it is forced through the house pipes and to the fixtures just as in a shallow well system—by the pressure of the air in the tank in the case of a pneumatic system or by means of the gravity head in the case of an overhead tank system.

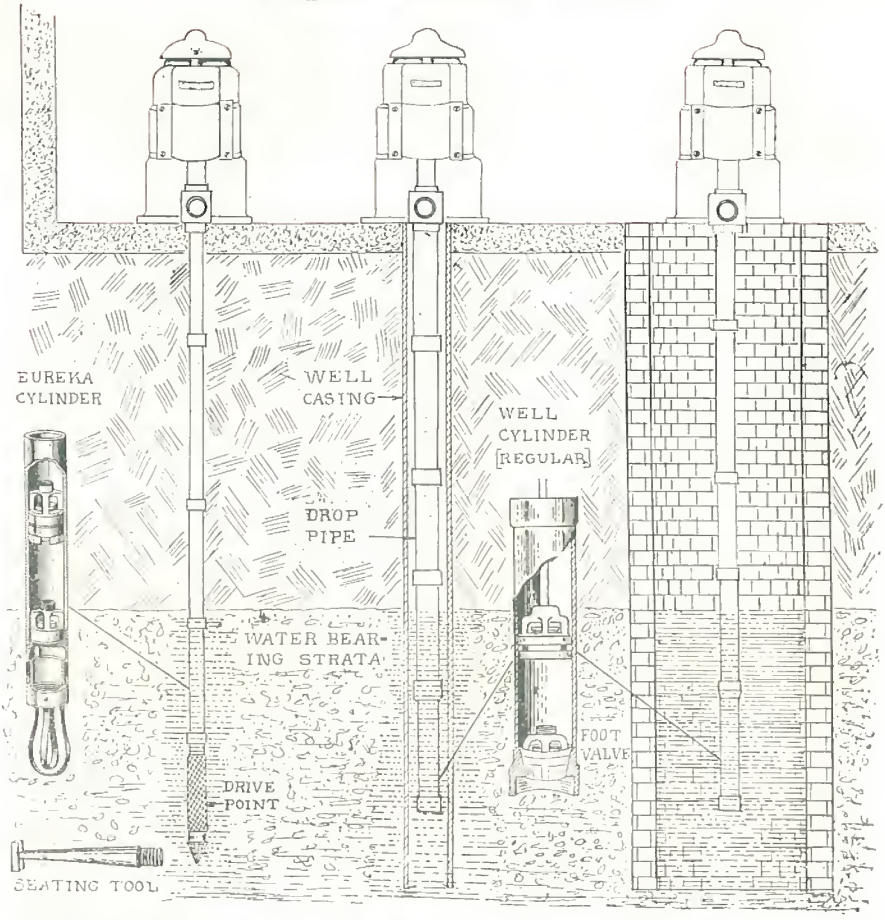
The important difference between a shallow well pump and a deep well pump is that the cylinder should be submerged under the water at all times, *and the power head must be installed directly over the well.*

The capacity of a deep well pumping unit is determined by the size of the cylinder, the length of stroke and the number of strokes per minute. The size of the cylinder is dependent upon the depth to the water level and the outside diameter of the well. Before determining just what deep well equipment is best suited for the purpose, it is therefore necessary to know: (1) depth of well; (2) inside diameter of the well; (3) lowest water level of well; (4) approximate flow of well in gallons per minute.

Having this information, one can readily select the deep well pumping unit best fitted to fill the service requirements under consideration.

As the Deep Well Plant must be installed directly over the well, oftentimes in cold localities where this necessitates placing the pump in an unheated pump house out in the yard, a frost-proof attachment is necessary. With the frost-proof attachment it is possible to operate the pump without bringing any of the water above the frost line until it gets to the point where it is to be used.

Types of Deep Wells

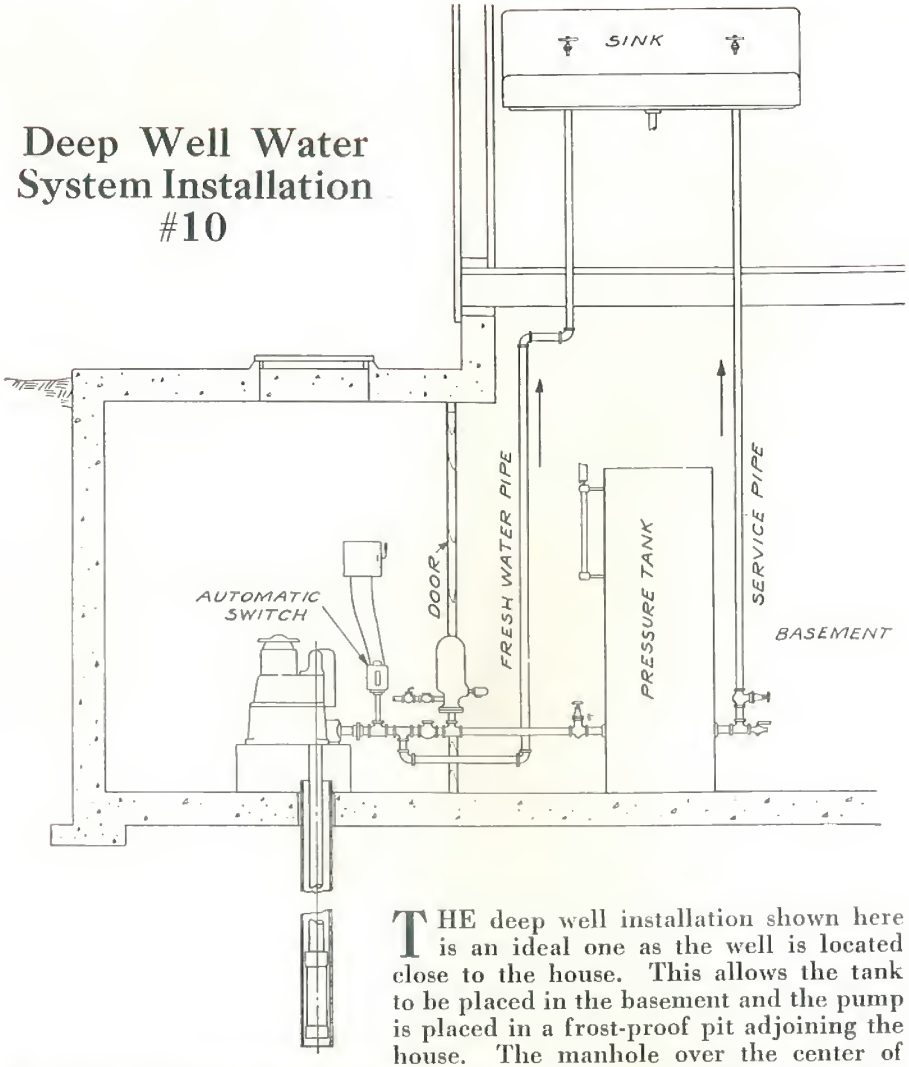


DEEP wells are primarily of three types: 1. Driven; 2. Drilled or cased; 3. Open or dug.

In the driven well a point is attached to the well pipe and the well pipe is then driven down until it reaches the water bearing stratum. These wells are usually of small diameter—2 inches or even less. The well pipe serves both as casing and drop pipe. Ordinarily a driven well has a depth of 50 feet or less, as it is difficult to drive points deeper than this.

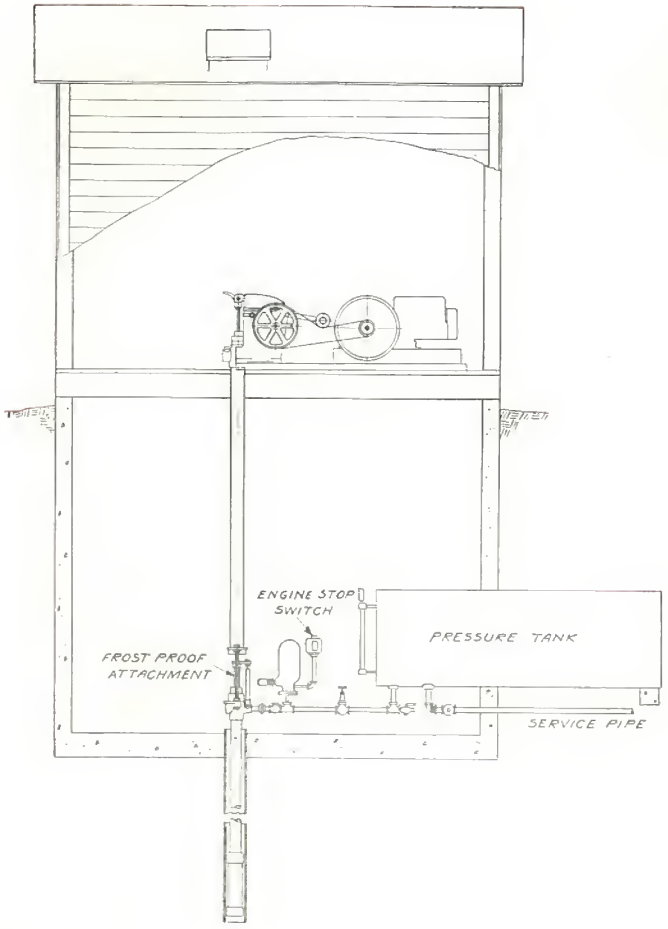
The drilled or cased well is by far the most common of the deep wells. Drilled wells sometimes go down to a depth of several hundred feet and run from 3 or 4 inches in diameter to a foot or even more. The open or dug well is seldom made nowadays because of the difficulty and expense involved in digging and bricking. A dug well will hardly ever go below forty or fifty feet. In this well the drop pipe with cylinder attached is lowered until the cylinder is submerged in water just as is the case of the drilled well.

Deep Well Water System Installation #10



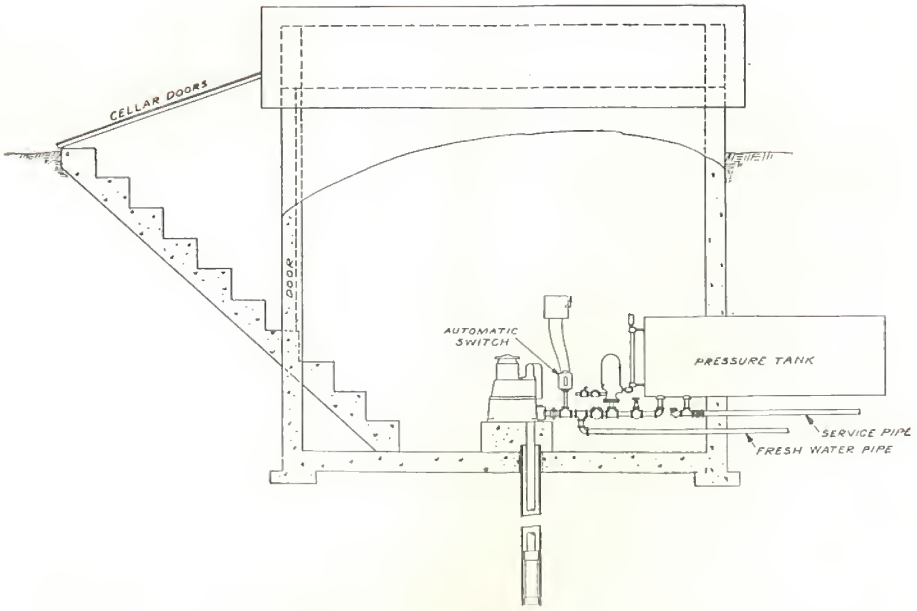
THE deep well installation shown here is an ideal one as the well is located close to the house. This allows the tank to be placed in the basement and the pump is placed in a frost-proof pit adjoining the house. The manhole over the center of the pump provides for withdrawing the drop pipe and sucker rod whenever it might become necessary to do some work on the pump.

The installation shown here includes the Fairbanks-Morse electric deep well direct connected pump unit, and is both automatic start and stop. Of course, this unit can be used for furnishing both hot and cold water under pressure and the general pipe arrangement would be the same as shown in installation No. 1. If electricity is not available the Fairbanks-Morse deep well pump head can be used with a "Z" Engine. Note also that the outfit is equipped to pump fresh water as well as water through the pressure tank.



Deep Well Water System Installation #11

DEEP well water system installations are almost identical with the exception that certain changes must be made according to the location of the well. In the illustration shown here the well is located out in the yard and the pumping unit is placed in a special pump shed or machine shed built over the well. As shown, the outfit is installed for use in cold climates as frost-proof attachment is included. The pressure tank is partially buried in the ground and the service pipe to the house and other buildings is also located below the frost line. This is an ideal installation for such conditions. The outfit shown is the Fairbanks-Morse "Z" Engine with deep well pump head belt-driven.

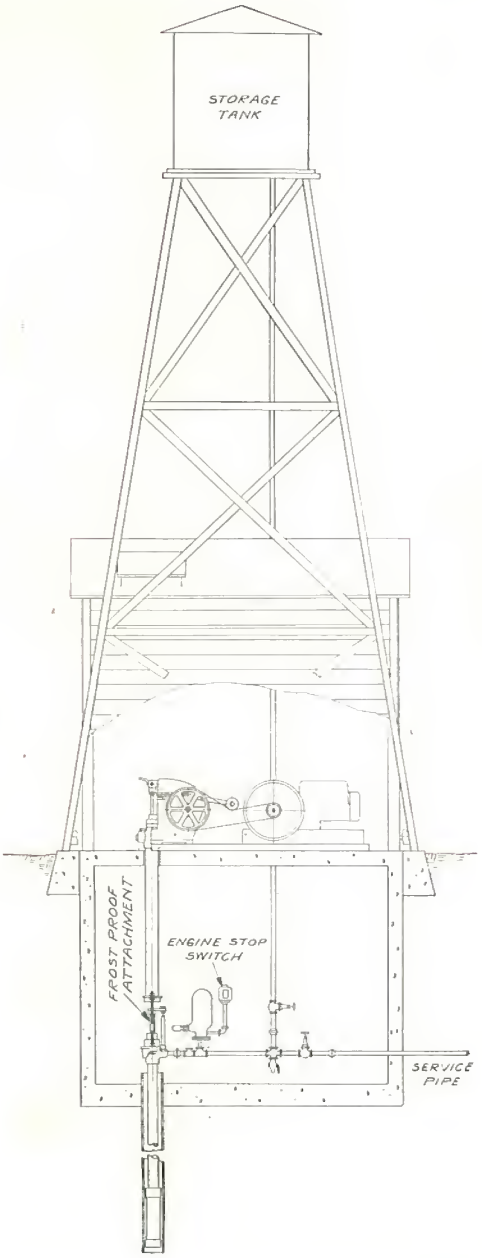


Deep Well Water System Installation #12

OFTENTIMES it is possible to locate the house containing the pump unit in such a manner that it is not necessary to include a frost-proof attachment. This is done usually by an underground concrete pump house. The installation shown here is one that is used very frequently. The pump house is so placed partially below the ground that the pump unit itself is frost-proofed. A cellar door covers the steps leading down into the house and a door is placed in the wall of the pit so that cold air is kept out as much as possible. Here again we show the pressure tank partially buried in the ground and also the service pipe and the fresh water pipe.

The outfit shown is the Fairbanks-Morse automatic electric direct connected deep well water system. In case electricity is not available the Fairbanks-Morse "Z" Engine and self-oiling deep well pump head unit as shown on page 31 can be used under similar conditions.

Deep Well Water System Installation #13



THE installation shown here is designed for use where a great deal of water is required. The water in the storage tank is available in case of fire and such an installation with either engine or electric-driven pump is also ideal for country or resort hotels, golf clubs, etc.

This installation shows the Fairbanks-Morse "Z" Engine and self-oiling deep well pump head belt-driven unit. A pit is provided for the frost-proof attachment and service pipe is placed below the frost level. Note the drain located at the bottom of the upright pipe leading to the storage tank which permits draining this pipe and tank in cold weather. Also note the gate valve in the pipe leading to the storage tank, by means of which the storage tank can be cut out entirely. The service pipe can be run to a storage tank located in the house and by so doing the outfit can be used both winter and summer without any danger of freezing the water in the storage tank on the tower or pipe leading to it. This outfit is equipped with a stop switch, but of course must be started manually.

If electricity is available either the Fairbanks-Morse automatic electric direct connected deep well water system or motor driven. self-oiling deep well power head is recommended. See pages 30 and 31.

How Water Under Pressure Brings Health and Happiness to the Home

EVERYONE knows that health is the first essential to any degree of happiness—and any physician will tell you that nothing is more important to good health than a plentiful supply of pure, fresh water. Internally and externally it is the greatest cleansing agent the family can have. Its proper use solves the problem of waste and sewage disposal.

The effect of a proper water supply in promoting good health is graphically shown in the chart on the next page. The lines in this chart represent the death rate from typhoid in a large middle Western city over the past 60 years. Proper guarding of the water supply and proper disposal of waste have practically eliminated deaths from this cause.

A further evidence of the importance of a proper water supply to good health is shown in a comparison of the typhoid rate in cities as compared with the country. Statistics show the death rate in the city is almost half that of the country, clearly demonstrating the effectiveness of water under pressure and modern sanitation methods.

A similar condition is found in an examination of infant mortality rates. Homes without bathtubs have a death rate among babies that is more than double the rate in homes with bathtubs. An investigation in an Eastern city showed the following infant mortality for each thousand infants born:

Homes with water piped into house	117.6
Homes where water is carried from out doors	198.2
Homes with bathtubs	72.6
Homes without bathtubs	164.8
Homes with water closets	108.3
Homes with outside privy	169.3

The intestinal disorder, diarrhea, is responsible for more baby deaths than any other disease. Diarrhea is caused by soil pollution, and soil pollution is caused by the improper disposal of waste and garbage. One of the chief contributing factors is the unsanitary and unsightly outside privy. From specific germs that may be carried in sewage at any time, there may result typhoid fever, tuberculosis, cholera, dysentery, diar-

Your doctor will tell you.

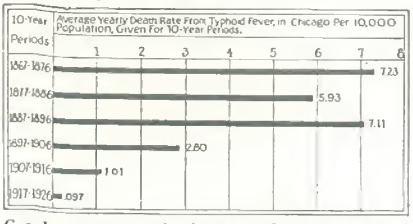
rhea, and other dangerous ailments, and it is probable many other maladies may be traced to human waste.

Sewage, drainage or other impure water may also contain the causative agents of numerous ailments common to live stock, such as tuberculosis, foot-and-mouth disease, hog cholera, anthrax, glanders and stomach and intestinal worms.

Prevention of soil pollution is one of the big factors in obtaining the results shown in the foregoing figures. The use of the inside toilet with adequate flushing apparatus, easily provided with water under pressure, entirely removes this danger.

The mortality statistics quoted indicate the improvement in the baby's health that results from the use of water under pressure. There are no statistics as to illness, but it is safe to say that for each death there are thousands of cases of illness—thousands of fretting, suffering babies.

One important factor in the baby's health is the health of the mother. Water under pressure conserves the mother's strength by doing away with much of the drudgery of housework. The modern laundry is especially helpful in reducing the work of caring for the baby's linens. Even the boiler and washing machine can be filled—a short piece of rubber hose attached to the faucet does the trick—by a mere turn of the faucet.



Graph represents deaths per 10,000 population from typhoid in city of Chicago. Modern use of water under pressure has almost eliminated deaths from this cause.

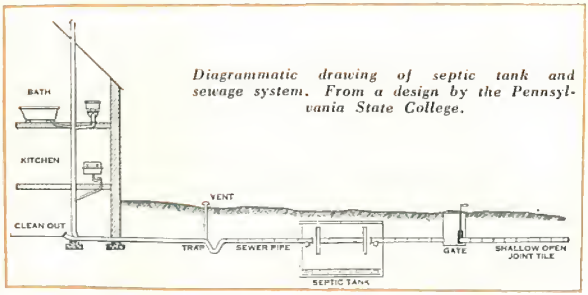
All of the back-breaking strain of pump handle and water pail—particularly dangerous while the baby is young—is completely removed.

Bath and inside toilet, too, aid the mother in properly caring for her health. Cleanliness is the greatest destroyer of disease known, and water is *the* cleaning agent in the home.

The mother's health demands that she be relieved of all possible work. Water under pressure makes the problem decidedly easier. It lightens the housework. Maids and nurses prefer to work in homes so provided.

But it is most important after the "hired help" has been dispensed with. The work then usually falls on the mother, and the elimination of water pail drudgery will do much in restoring her quickly to complete health.

Unsightly and unsanitary the outdoor toilet is one of the greatest causes of disease.



Diagrammatic drawing of septic tank and sewage system. From a design by the Pennsylvania State College.

Pure, health-giving water supply and proper sewage disposal are interdependent. Correct sewage disposal requires an abundant supply of water and, particularly in the case of shallow wells, the proper disposal of sewage and excretions is essential or the water supply will be contaminated.

A sewage disposal system which will prove effective for the average home consists of necessary drains for receiving slops and waste water, an inside toilet with flushing apparatus, a septic tank, a distribution field where the effluent evaporates and a sewage system to connect the different units. Such a system is shown in the diagrammatic drawing on this page, after a design by the Pennsylvania State College.

It should be understood that a septic tank is merely a place where the sewage enters from the house and undergoes decomposition. It is very similar to the decomposition of garbage which is collected in a garbage pail. If the material remains in the pail long enough and has sufficient water, the garbage will be decomposed to the point that it contains very little solid material in large particles, but is finely divided and thoroughly mixed with the water. The septic tank is a place where the solid matter of the sewage is ground into fine particles. Sewage is not purified by the process of decomposition; it is merely decomposed into fine particles, thereby making it comparatively easy to dispose of the effluent.

After decomposition in the septic tank the effluent is run out into open-jointed drain tile, laid about 12 to 15 inches under the surface of the ground. The effluent from the tank passes out through the tile into the soil, and the moisture is disposed of by evaporation into the air. It is a good plan to place the drain tile under a lawn or meadow, as the leaves of the grass form a greater amount of evaporating surface than would be available otherwise.

Therefore, there are two distinct steps in the septic-tank method of sewage disposal. First decomposition, and second evaporation. If the loose-jointed drain tile were placed several feet in the ground the effluent from the septic tank would likely enter some underground water course and thus pollute some well or spring.

How a Home Water System Adds to Property Value

HOME owners today are insisting on modern homes, and are willing to pay for them. They know modern conveniences justify an added investment. There is less need for hired help, more time for profitable employment or recreation, a more livable home, less expense for doctors and medicine and a respite from the back-breaking, nerve-racking drudgery of carrying water.

The modern home has established new standards of refinement in living—and the secret of the modern home is water under pressure. The bathroom with its bathtub, shower, lavatory and toilet; the kitchen with labor-saving drainage system and hot and cold water supply; the convenient laundry where the entire washing can be done without lifting a single drop of water—these are the things that water under pressure has made possible; these are the things that place the mark of refinement on the home and add to property values.

The value of water pressure service can be seen at the end of any city main. Residences with water pressure usually bring more than double the rent of residences without this service. Housekeepers have learned that the conveniences afforded are worth from $300 to $500 a year. No wonder home owners welcome the opportunity to pay an assessment of $250 to $300 on a fifty-foot lot for the privilege of water main service.

But now, water under pressure—and its comforts—is no longer confined to the city mains. You can have water at the turn of a faucet in your home, anywhere, with an F-M Home Water System. The initial cost is smaller—less than half the amount city owners are assessed for a fifty-foot lot for the installation of a water main, and you have the added advantage of fresh well water for drinking purposes. The cost of operation—a few cents a week—is scarcely half the usual meter tax.

Owners of homes just beyond the city water main need no longer envy their neighbors who have city service. They need no longer bother with petitions or lobbies for expensive water main extensions. The F-M Home Water System — economical, easily installed, automatic—solves their problem.

How a Home Water System Reduces Fire Risk

HOW safe is your home from fire? If fire broke out tonight—would you have to depend on a pail and a hand pump or could you quench the blaze in its incipient stage with a quick supply of water under pressure?

The value of the home and other buildings that form the average suburban or farm home, runs into thousands of dollars. Such an investment is worthy of the best protection that can be secured. A comparison of the losses in property with and without city service proves homes with water pressure protection are many times safer from fire.

Early, effective action is the secret of preventing loss after a fire has started. A barrel of water when the fire breaks out is usually of more value than the city fire department fifteen minutes later. This is the reason that F-M Home Water Systems are so valuable in reducing fire risk. With running water under pressure, the person discovering the fire can at once direct a steady stream of water at the base of the blaze. They need not lose valuable time frantically calling for help. There is no delay going to and from the pump. A turn of a faucet gives them water under pressure.

F-M Home Water Systems are built in sizes from 210 to 5000 gallons capacity. The 210 gallon size will throw a 30 or 40 foot stream using a half-inch Gem nozzle. This stream is of real value in subduing an incipient fire. The larger sizes of course deliver more water, and are correspondingly more effective.

Fire prevention is far better than fire insurance. It is impossible to legally insure property for its complete replacement cost. Considering the material value alone, fire is always costly. But fire cost in the home cannot be reckoned in dollars and cents. Any daily paper will testify to the degree of its tragedy. Insurance cannot restore irreplaceable treasuries; it cannot protect against the suffering of loved ones.

A farm building burns every fifteen minutes somewhere in the United States. Yours may be the next. If you discovered an incipient fire in your home tonight, could you quickly direct a liberal supply of water against it? Or, while the fire gained uncontrollable headway, would you frantically call on neighbors and family in a useless endeavor with the hand pump and a bucket brigade?

How to Have Cistern Water Under Pressure

WATER from wells, and in many cases the city supply, is often so hard as to be unusable for laundry, bathing and lavatory purposes. In such cases houses are very often provided with cisterns for the storage of rain water, so that pure, soft water may be provided for all washing purposes.

It has been common practice to use a hand pump for the cistern supply, even where the supply for drinking and toilet purposes comes from city mains. This, in spite of the fact that rain water is used for practically all of the housework. The result has been that the women have been subjected to almost the same amount of inconvenience and drudgery as though city pressure had never been provided.

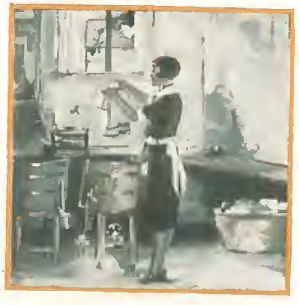
With the cistern water under pressure, this drudgery of pump handle and pail is completely ended. By piping through water front or heater, hot water can be provided. There is no more stinting in the use of warm or hot soft water. All that is required is a turn of the faucet, and lavatory, bath or laundry tub is filled.

Women need no longer finish wash day, worn out. Few people realize the work required in doing the family washing, just to carry water in and out and transfer it from one receptacle to another.

* * * *

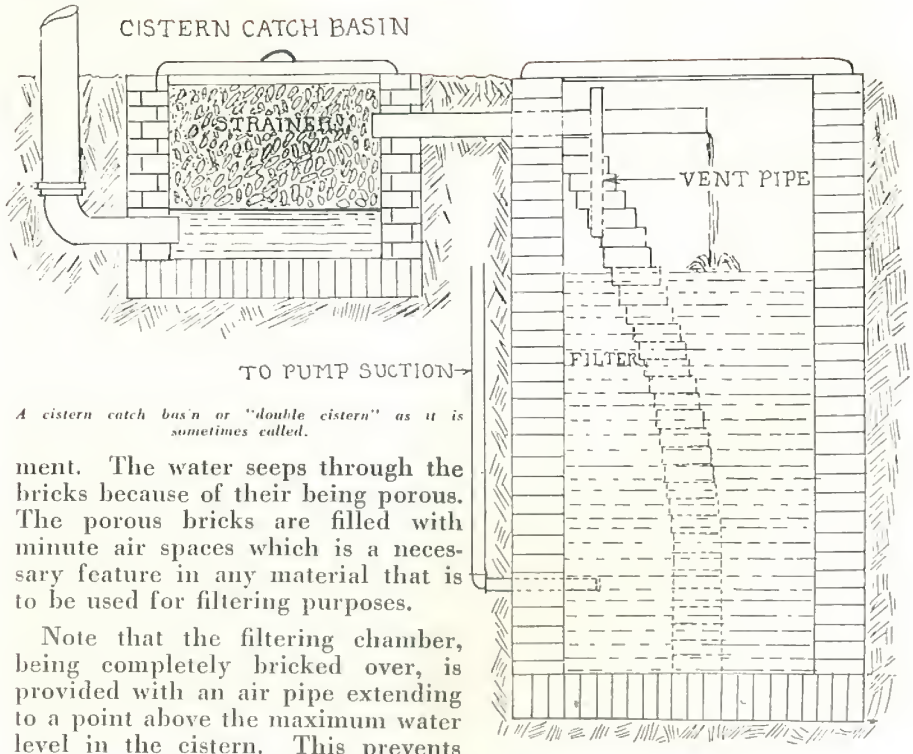
Many people however have no cistern so a few suggestions to those considering such an installation are not out of order.

The opportunities for pollution after the water enters the cistern depend upon the construction and protection of the type of cistern used. Leaks offer the most common opportunity for pollution. Ground water around cisterns is frequently polluted from surface sources, and the cistern should be so constructed that no surface water can filter into it.



Rain water, if it could be stored without acquiring any impurities, would be the purest water that could be obtained, but in falling off the roof it carries with it into the cistern such things as dust, dirt, twigs, leaves, etc. In time, the cistern becomes dirty and the water black so it is advisable to have a filter of some sort in the cistern to keep the water clear.

On the next page, we show a common form of cistern filter. It consists simply of a portion of the cistern bricked off into a separate compart-



A cistern catch basin or "double cistern" as it is sometimes called.

ment. The water seeps through the bricks because of their being porous. The porous bricks are filled with minute air spaces which is a necessary feature in any material that is to be used for filtering purposes.

Note that the filtering chamber, being completely bricked over, is provided with an air pipe extending to a point above the maximum water level in the cistern. This prevents the filter chamber from becoming air bound and thus interfere with the successful operation of the pump, and in addition it insures the filter chamber always being aerated.

Above: Brick compartment inside the cistern to form a filter chamber.

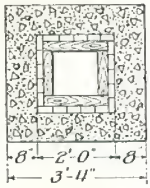
The filter chamber does not necessarily have to take this form, although this is an easy one to construct as it simply slopes gradually to the cistern wall. Sometimes the filter chamber is constructed in the form of a box at the bottom of the cistern: sometimes in the case of a square cistern, a corner is simply bricked off. But the important thing is to see that the compartment is bricked all over so that the cistern water will have to pass *through* the brick in order to get into the chamber.

One more suggestion: in deciding on the capacity, it is well to have the cistern over-size, rather than too small. The additional cost is not great, and the added capacity is certain to be convenient in protracted periods of drought.

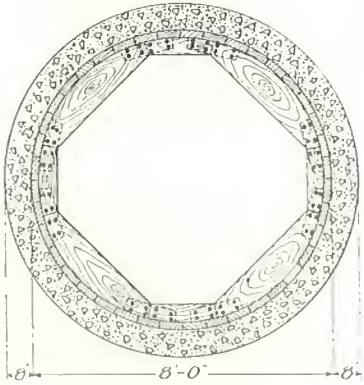
The F-M Home Water System can be used for cistern water supply in conjunction with city water pressure. The same system can also be used in combination to provide both well

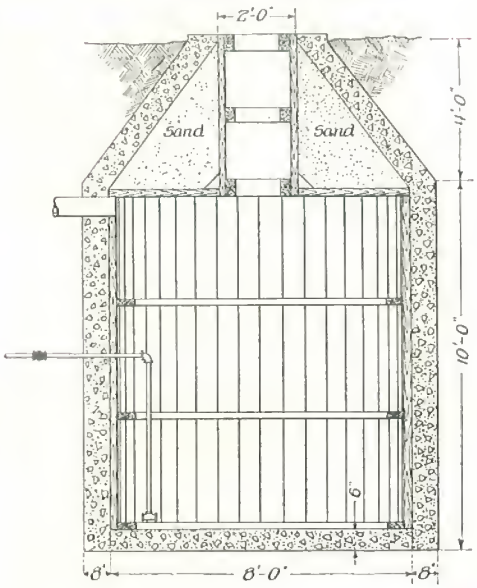
water and cistern water under pressure.

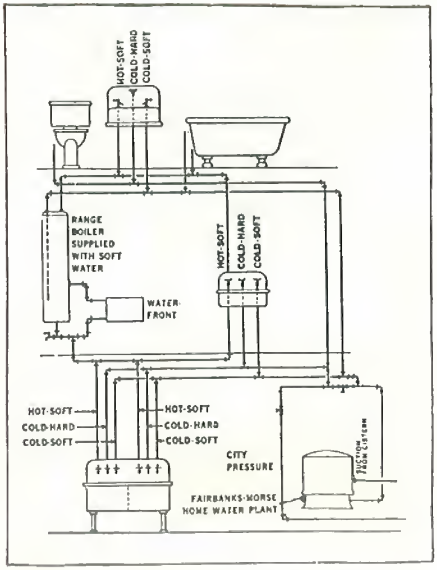
Diagrammatic drawing showing the piping arrangement for both these conditions are shown on this page.



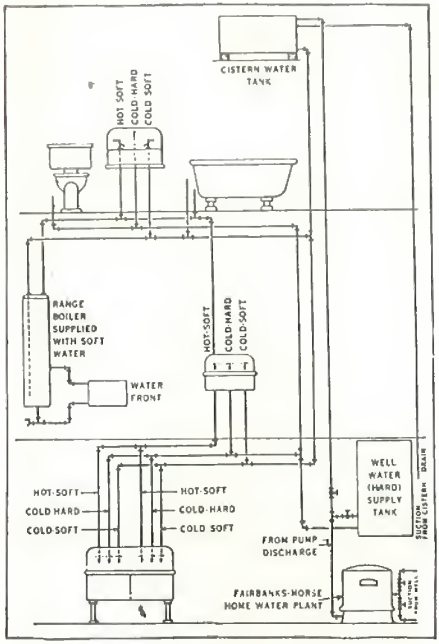
Concrete cistern design showing arrangement of forms.







Diagrammatic drawing showing the typical arrangement of piping cistern water under pressure in conjunction with city pressure service.



Diagrammatic drawing showing typical arrangement of F-M Home Water System connected to provide both well water and cistern water under pressure.

How An F-M Home Water System Increases Farm Profits

WATER under pressure is even more valuable on the farm than in the city residence. On the farm it serves the double purpose of saving work and chores, and increasing returns from livestock and land.

Water is particularly important for the dairy herd. Their product, milk, is more than 80 per cent water and an abundance of water is necessary for maximum production. Individual drinking fountains in the barn will increase milk production from 8 to 20%.

The more frequently a cow has access to water, the nearer she comes to fulfilling her needs for water. At the South Dakota Experiment Station, cows watered twice or three times a day drank almost 40% more water than those watered but once daily and produced 20% more milk as a result. Such an increase in milk production would quickly pay the cost of a home water system.

Water is also very important in feeding livestock. It performs the dual function of supplying the necessary water for the formation of the animal's body and it also serves as a cleanser to keep the body free from waste and in the healthy condition necessary to rapid and maximum growth.

Without plenty of water the fattening of hogs, livestock and sheep is delayed and more feed is required. Drinking fountains in the chicken house too aid in egg production.

With a proper sized water plant, a system of irrigation can be provided for that will insure the garden against drought, one of the prime factors of loss.

Water under pressure further increases profits by saving labor. Chores are done in half the time. More time can be spent on productive work in the fields.

Keeping the children home on the farm is another of lifes problems today. With an honest pride in their country home, they will not be so desirous to accept the call of the city. The key to the attractive farm house is water under pressure. Outside, lawns and gardens are kept green, flowers bloom luxuriantly; inside, the modern bathroom, the kitchen with hot and cold water fixtures, the laundry completely equipped—all give the home that mark of refinement which every boy and girl should want—do want in *their* home.

Water Under Pressure---The Cheapest Servant You Can Hire

WHICH one improvement would be the greatest benefit to your home? When a large number of farm women were asked this question recently, 73 per cent chose water under pressure.

Why? Because water under pressure helped them do their work. One woman said water under pressure was the equal of a hired girl.

"*The water pail is empty.*" How often you hear that phrase around any home that is without water under pressure. Whenever the men come in from a long, hot day's work, or on a cold winter's day after hours of facing the storm; the water pail always has to be filled. But, even so, the truth is, it is the woman who carries the water from the well. Every time there is a dish to be washed, every time there is a floor to be scrubbed, every time there is a meal to be cooked—no matter what the task, upstairs or down, *the water pail is empty* and must be filled. Tasks of this kind are much harder for women than men. There are times when the strain is very injurious and may even cause lifelong illness.

Ask any woman. She will tell you the least agreeable job around the home is dish washing. There is something about the monotonous recurrence of this work—its apparent uselessness, which makes it distasteful far beyond the actuallabor involved.

With water under pressure, the drudgery is ended. By comparison the tedious task has become a pleasure. A kitchen sink at the proper height, a good dish mop and cleaner, and almost without wetting the hands, the largest pile of dishes simply melts before the magic of water under pressure. Then, with the dishes piled in a drainer, a swiss-sh through the hot water and the job is done.

Water under pressure certainly pays. Figure it out for yourself. In money spent for extra help, in time lost, that could be more profitably spent on gardens or in raising poultry; in expense due to illness; in dozens of ways, you are paying for the service of water under pressure.

Why not transfer this expense, and make an investment that will pay you a profit, that will add to the value of your property, that will bring health and happiness to your home? See the Fairbanks-Morse dealer in your locality, or write us direct.

F-M Automatic Electric Home Water Systems for Shallow Wells

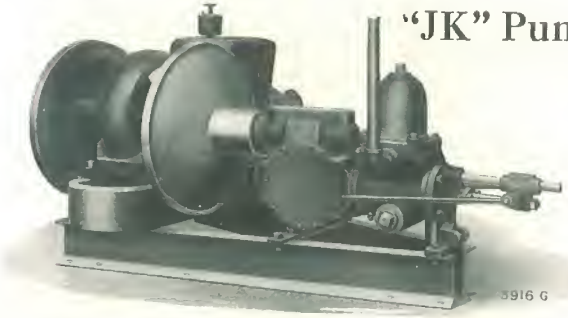
Two sizes: 210 and 420 gals. per hour–the biggest Home Water System values ever offered

THE water systems shown here are the outstanding triumphs in home comfort equipment. Each is a big capacity shallow well system that gives faucet service when and where it is wanted. The 210 gallon size is recommended for summer cottages and average homes. It is ideal for soft water service and the general water requirements of a family of 5 to 7 persons. The 420 gallon unit is suitable for large residences or wherever the water requirements are too heavy for the 210 gallon outfit. 60 cycle motor furnished as standard; motors of 25, 30 and 40 cycles may be had on special order at a small additional price. Finished in Delft-blue lacquer.

Completely enclosed and fully protected. Quickly accessible—just lift the hood.

No Other Electric Water System Has All These Features:

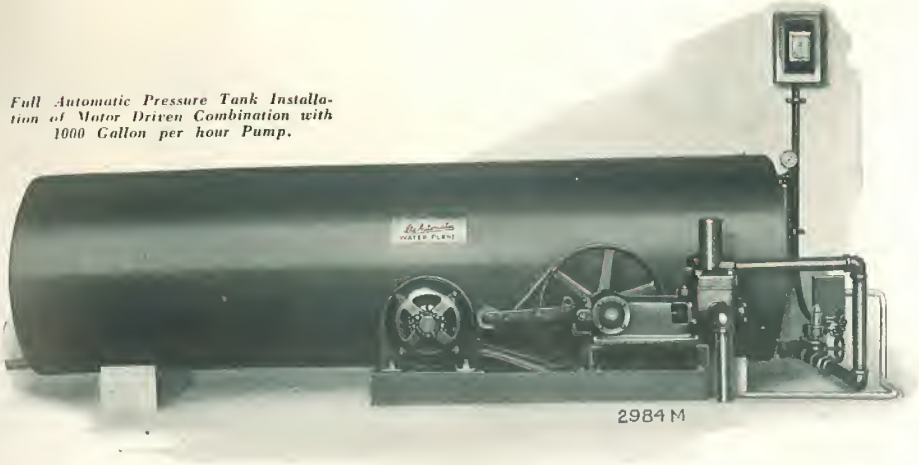
1. Completely enclosed. All parts fully protected.
2. Compact—19″ in diameter. 21″ high.
3. Big capacity.
4. Entirely automatic.
5. Easy to install—only two pipe connections.
6. Completely equipped, including electric motor, automatic switch, pump and tank.
7. Quickly accessible—simply lift the hood.
8. Quiet and exceptionally smooth running.
9. Self-oiling.
10. Supplies steady, full stream without pulsation.
11. Fresh water connection with every pump at no extra charge.
12. Can also be used with large storage tank when desired.
13. Genuine F-M units throughout. Fully guaranteed—the biggest home water system values ever offered.



Type "JK" Silent Drive House Force Pump Direct Connected to 2 H. P. "Z" Engine.

"JK" Pump and "Z" Engine

THE "Z" Engine and "JK" Pump unit shown here is for use where electricity is not available. Designed for house service, pumping to overhead attic or pneumatic tanks. These pumps have a displacement of 640 gallons per hour when the engine is operating at 600 R. P. M.



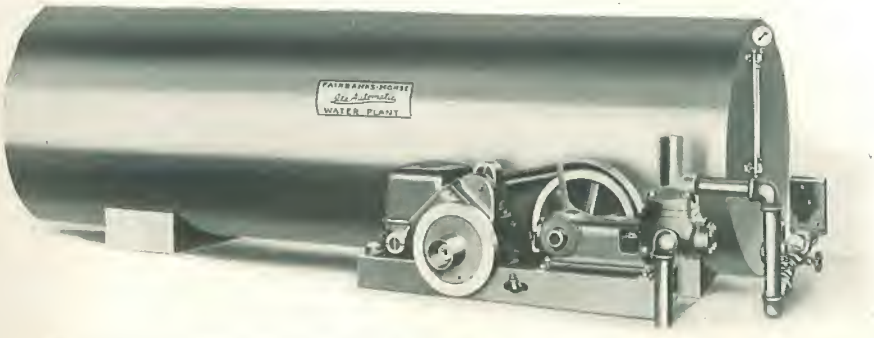
Full Automatic Pressure Tank Installation of Motor Driven Combination with 1000 Gallon per hour Pump.

Self-Oiling Typhoon Power Pumps

THESE Pumps can be used for any general pumping where the lift is not greater than 22 feet and the total discharge head does not exceed 100 lbs. pressure or 230 feet. Being made in five sizes, 600, 1000, 1500, 2500 and 5000 gallons per hour, this range of capacities lends it particularly to installation for any number of requirements. They can be used with overhead or pressure tanks, and can be operated by electric motor or gas engine.

The electric driven outfit above with full automatic pressure tank can be started or stopped merely by throwing a switch. This is a completely automatic outfit—self-starting when the pressure in the tank gets low, and self-stopping when the pressure reaches the required maximum.

Where electricity is not available, the "Z" Engine driven combination illustrated below is recommended. These outfits can be furnished with any size tank desired. This outfit must be started manually but it stops automatically when the pressure in the tank reaches the operating maximum.



Semi-Automatic Pressure Tank Installation of "Z" Engine Driven Combination with 1000 Gallon per Hour Pump.

F-M Automatic Electric Home Water Systems for Deep Wells

For Open Tank Service with Either Manual or Automatic Float Switch Control, or for Use with Automatic Pressure Systems.

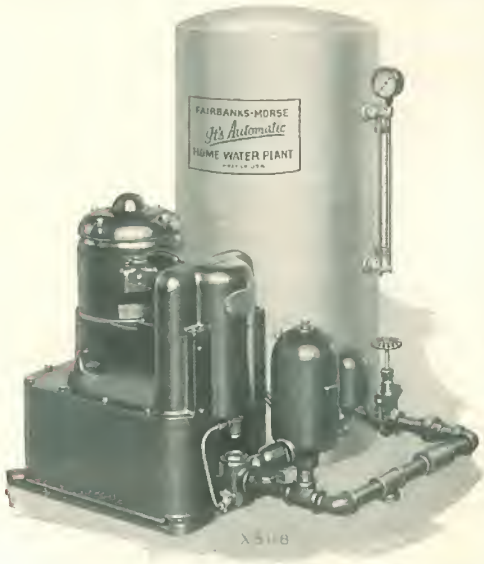
Sizes: ¼, ½, ¾, 2 and 3 H. P.

THE Fairbanks-Morse Deep Well Home Water Pump illustrated here is designed for pumping from driven, open or cased wells where the water lift is greater than 22 feet. It is furnished only for electric drive.

This style pump can be used for open tank service with either manual or automatic float switch control or as a complete automatic pressure tank system.

This head, in addition to lifting the water out of the well, is capable of raising the water 40 feet above the pump, including friction loss in the discharge pipe.

The manually controlled system is recommended for installations where the customer wishes to pump from a deep well and has an open tank but has no need for the pump automatic start-and-stop feature. The same pump with open tank system and automatic float switch is for use under similar conditions but has the added automatic start-and-stop feature. The pump may also be used where the customer desires a completely enclosed pressure tank system, with automatic start-and-stop.

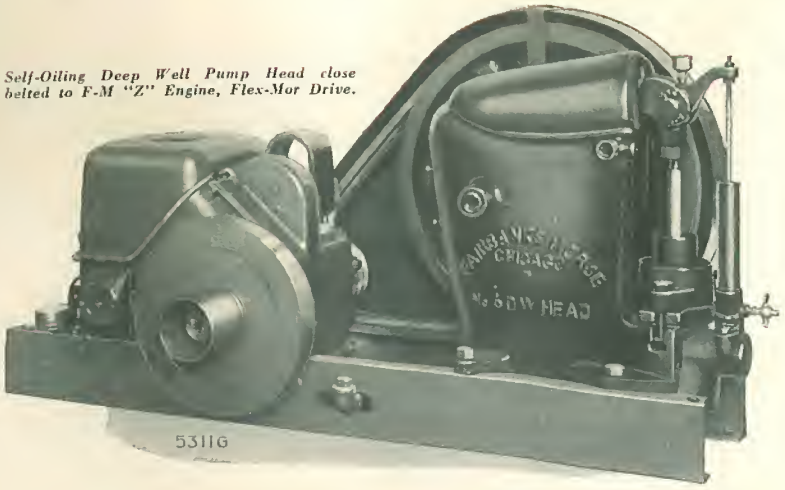


¼ H. P. Deep Well Home Water Pump with 35-Gallon Galvanized tank.

Design in a deep well pump plays an all-important part. This pump is correctly designed. The entire working mechanism of the Fairbanks-Morse Deep Well Home Water Pump is enclosed in a cast iron housing—fully protected—at the same time all these parts are readily accessible.

The motor is housed in a protective, well ventilated frame.

The base of the pump acts as an oil reservoir. All working parts are oiled automatically. Being completely enclosed, there is no chance for the oil to drip into the well. Ask for special circular.

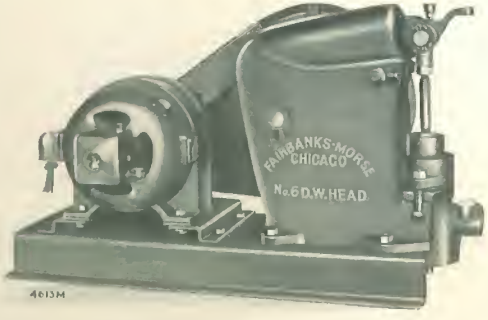


Self-Oiling Deep Well Pump Head close belted to F-M "Z" Engine, Flex-Mor Drive.

F-M Self-Oiling Deep Well Pump Heads

THE Fairbanks-Morse Type "B" Self-Oiling Deep Well Pump Head shown here is designed for pumping from driven, open or cased wells where the water lift is greater than 22 feet. It is especially adaptable for general pumping service on farms, rural estates, plantations, ranches, or for apartment houses, small hotels, mills, factories, country schools and churches, dairies, railroad tanks and stations, roadside filling stations, etc. In fact wherever it is desired to lift water from a source more than 22 feet below the pump, this type of pump head will fulfill the requirements economically and satisfactorily.

It can be operated by either an electric motor, automatically or manually controlled, or by a gasoline-kerosene engine. Any one of a variety of combinations can be used. Where line shaft or other power is already available, the pump head can be furnished alone for direct belt connection.



Self-Oiling Deep Well Pump Head electrically driven unit, with Flex-Mor drive.

The engine driven outfits may be used for either open tank or pressure tank service. The pressure tank outfits are not completely automatic, but automatic stop can be provided on special order in the form of an auxiliary diaphragm pressure switch that will automatically ground the ignition circuit and stop the engine when the pressure in the storage tank reaches a predetermined maximum limit.

A Home Water System for Every Requirement Built by Water System Specialists

AS MANUFACTURERS of pumps for nearly half a century, Fairbanks, Morse & Co. have earned and maintained a reputation for reliable pumping equipment of practically every description for various kinds of service. This long experience in pump manufacture is of benefit to users because it insures water systems that are well designed and constructed for the particular service for which they are recommended. Fairbanks-Morse Water Systems invariably will be found giving satisfactory and dependable operation.

This high degree of serviceability and dependability is the result of numerous refinements of design and construction. In addition to the improvements made by Fairbanks-Morse engineers. such factors as modern manufacturing methods, quaiity of materials, high-grade workmanship, quantity production and world-wide distribution contribute to the value of these pumps in the different classes of service for which they are adapted.

All materials entering into their construction are carefully selected, and numerous inspections are made during the process of manufacture.

In order to give prompt service, Fairbanks, Morse & Co. maintain branch offices in the principal cities of the United States and foreign countries.

Whether your source of supply is a cistern, spring, lake, stream, shallow well or deep well, there is a Fairbanks-Morse Home Water System that will serve you perfectly. Made in capacities from 210 to 5000 gallons per hour. These systems can be furnished to operate on electric current, gasoline or kerosene. These systems are quickly and easily installed at small expense.

Back of F-M Home Water Systems is this guaranty. It is as brief as it is strong.

> *"If any part of a Fairbanks-Morse Product fails because of defect in workmanship, material or design, this part will be replaced without charge, f. o. b. factory, upon return, (transportation prepaid), of the defective part to the factory."*

To those who have had dealings with the company at some time or other during the past seventy years, the spirit of the guaranty is well known.

Your local Fairbanks-Morse dealer will gladly furnish you with complete information and give you a free demonstration, or write our nearest Branch House.

Fairbanks, Morse & Co.

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